Summary Packet

May 2010

Documents Included in the Packet

Following our meetings, you should have received the following informational packets:

1. **Background and Summary Notes from Wilson Electronics**

2. **Testimonial of a Tug Boat Engineer – Submitted during the Open Comment Period** – Included is a comment submitted by the Chief Engineer for Crowley Marine Services in Palmer, Alaska.

   In addition, you will receive a separate packet which includes numerous customer experiences and testimonials.

3. **Government Purchasers List—**List of government accounts with Wilson Electronics

4. **Signal Boosters and the Law—**Lukas, Nace, Gutierrez & Sachs, LLP Position Statement

5. **White Paper on Signal Boosters from Andrew Seybold**

Background and Summary Notes on Wilson Electronics Position

On November 3, 2009, Wilson Electronics submitted a Petition for Rulemaking, proposing that the FCC include additional tests that cell phone signal boosters must pass in order to meet FCC's certification standards for these devices. They are:

- Oscillation (feedback) detection and auto-shut down of the booster, to prevent interference with cell towers
- Proximity detection and auto shut down of the booster, to prevent signal overload of cell towers
- Bi-directional signal amplification or boosting the signal from the cell tower to the device and from the device back to the tower, to improve customer satisfaction

Based on the request for rule change, Wilson Electronics' position is that: All cell phone or data card subscribers who pay for cellular service have the right to use signal amplification techniques and devices to ensure that their service is reliable.

- Wilson agrees with statements made by cell carriers and CTIA that the reliability of wireless communication can be harmed by the use of poorly designed, technically deficient boosters.

- Well designed and engineered signal boosters are customer retention tools that can provide needed improvement in cell service, without causing interference to cellular networks or to public safety radio systems.

- Wilson works closely with Canadian wireless carriers TELUS and Bell Canada. Both carriers actively market Wilson signal boosters to its subscribers, and share data that helps Wilson design more effective signal boosters.

- Following a rural crash with multiple fatalities, the Nation Transportation Safety Board (NTSB) issued a report recommending that busses traveling on rural highways be equipped with signal boosters, and named Wilson Electronics as the provider.

- Public safety and other first responders use signal boosters to save lives and access vital information. In comments to the FCC on this issue, G. Scott McDermid of Wakulla County Florida explained: "We use the Wilson cell phone amplifiers in our Ambulances. They are used to allow our staff to have cell phone and aircard signal where they would not otherwise. ... Without these amplifiers we would simply not have these capabilities to offer our Firefighters, EMTs, and Paramedics who use these tools to protect our County's citizens and visitors 24 hours a day." (FCC Comment 2/12/2010) Wilson has provided boosters to nearly 600 government entities (see accompanying list of government purchasers).

- Wilson is prepared to work with cell phone carriers in order to verify our findings that their boosters will work. The carriers have been unwilling to participate in dialogue to prove the effectiveness of its boosters.

- Wilson hopes this issue is not a throwback to the issue surrounding the Carterfone decision of the 1960's.

Open Letter from A Tugboat Engineer

FCC / Commissioners,

My name is Carl L. Jones and I live in Palmer, Alaska. I work as a Chief Engineer for Crowley Marine Services on Tug Boats with Escort and Response duties for the Super Tankers that transport Oil from the Alyeska Pipeline to the world. I have been doing this for the last 10 years, I am a member and Union Steward for the Inland Boatman's Union of the Pacific and we have some 160 plus members working on the Tugs and Barges here in the system.

I recently became aware of the FCC's intention's to possibly put in place regulations involving Cell Signal Boosters. I feel I must explain a few things as to how this could and would affect me, my shipmates and my co-workers here in Valdez.

First of all you must truly understand what it means when I tell you that I have worked here for 10 years. Our work rotations put us on these vessels for 50% of our lives. So for me having worked here for the past 10 years of my live that means that five years worth of that time I was away from home, my wife, my Sons, my everything and basically a prisoner on a Tug Boat. We do not get shore leave because we must be available to respond to an emergency at a moments notice. What does all this have to do with Cell Signal Boosters? Let me tell you.

The one thing that makes our lives in this situation bearable is communication with the outside world and our families. For years we had nothing, marriages crumbled and morale was always a problem. Then things changed, cell phones alone did help some but service due to signal strength where we are and to the vessels just didn't work well. Then we discovered the Wilson Cell Signal Boosters and antennas. It has been unbelievable for us and everyone in similar situations since this technology became available, and one of the major keys is that the equipment is easy to get, affordable and Wilson backs everything up with great service and support.

We can now not only talk with our families daily but with broadband Internet now we can receive photos from home and use the web for all kinds of things and the Cell signal Boosters are what make it all possible. Without them and the ease and availability of getting them none of this would work at all.

Anyone telling you that cell signal boosters should only be approved and placed in service by the carriers themselves exclusively is just out for the best interest of the carriers and it really stinks of corporate greed to put it lightly. To do this would effect great harm on the general public and could slam the door on open access to phone service and the Internet for thousands of people.

I strongly urge you to rethink your plans on this matter and make sure that Cell Signal Boosters stay readily available to the general public in every way. They have been an unbelievable asset to me and my co-workers lives and we would be devastated if anything changed!

Thank you for your time and consideration.

Sincerely,
Carl L. Jones
IBU PSR Union Steward/Tug Aware/Valdez, Alaska
Phone- 907-232-5305
Email- ibucarl@yahoo.com

Government Booster Users-Partial List.xls

Government Customer	City	State
13 JUDICIAL DIST. PROSECUTORS	MAGNOLIA	AR
18TH AIRBONE CCORPS G3	FORT BRAGG	NC
3RD BDE- FORT CAMPBELL	FORT CAMPBELL	KY
AIR NATIONAL GUARD	ESSEX JUNCTION	VT
ALBERTA VOLUNTEER FIRE DEPT.	ALBERTA	VA
AMADOR COUNTY SHERIFF'S OFFICE	JACKSON	CA
ANGEL FIRE - FIRE DEPARTMENT	ANGEL FIRE	NM
ANGWIN COMMUNITY AMBULANCE	ANGWIN	CA
ARIZONA STATE PARKS	PHOENIX	AZ
ARMY & AIRFORCE EXCHANGE SRVC	DALLAS	TX
ASCENSION PARISH GOVERNMENT	GONZALES	LA
ASHLAND COUNTY SHERIFF'S	ASHLAND	OH
ATF	SEATTLE	WA
AUSTIN BOROUGH POLICE DEPT	AUSTIN	PA
BAE SYSTEMS	SEALY	TX
BAIN BRIDGE TOWNSHIP FIRE DEPT	CHAGRIN FALLS	OH
BEL AIR FIRE CO	FOREST HILL	MD
BETHEL BOARD OF EDUCATION	BETHEL	CT
BETHEL POLICE DEPARTMENT	BETHEL	CT
BEXAR COUNTY HOSPITAL DISTRICT	SAN ANTONIO	TX
BINGHAM COUNTY	BLACKFOOT	ID
BLM - DEPARTMENT OF INTERIOR	CANON CITY	CO
BLM - DOI	SALEM	OR
BLM - FIRE	LAS VEGAS	NV
BLM- DEPARTMENT OF INTERIOR	CASPER	WY
BLM- FIRE SUPPRESSION	ROCK SPRINGS	WY
BLM LEWISTOWN FIELD OFFICE	LEWISTOWN	MT
BLM UTAH STATE OFFICE	RICHFIELD	UT
BLUE RIDGE FIRE AND RESCUE	EAST FLAT ROCK	NC
BOISE STATE UNIVERSITY-IT DEPT	BOISE	ID
BONNEVILLE POWER ADMIN./JM-3	PORTLAND	OR
BOULDER MOUNT. FIRE PROTECTION	BOULDER	CO
BOX ELDER SCHOOL DISTRICT	BRIGHAM CITY	UT
BOYLE COUNTY FIRE DEPARTMENT	DANVILLE	KY
BREVARD COUNTY SHERIFF'S OFFIC	MELBOURNE	FL
BREVARD COUNTY SHERIFF'S OFFIC	TITUSVILLE	FL
BRIGHAM YOUNG UNIVERSITY	PROVO	UT
BRIGHTON VOLUNTEER AMBULANCE	ROCHESTER	NY
BROWNING SCHOOL DISTRICT #9	BROWNING	MT
BUR. INDIAN AFFAIRS-GREAT LAKE	ASHLAND	WI
BUREAU OF ATF	WASHINGTON	DC
BUREAU OF LAND MANAGEMENT	SAFFORD	AZ
BUREAU OF LAND MANAGEMENT	YUMA	AZ
BUREAU OF LAND MANAGEMENT	BISHOP	CA
BUREAU OF LAND MANAGEMENT	N PALM SPRINGS	CA
BUREAU OF LAND MANAGEMENT	LAS CRUCES	NM
BUREAU OF LAND MANAGEMENT	SAINT GEORGE	UT
BUREAU OF LAND MGMT WORLAND	WORLAND	WY
C.M. RUSSELL NATIONAL WILDLIFE	LEWISTOWN	MT
CAL FIRE	REDDING	CA
CAL FIRE	WILLITS	CA
CALFIRE	MARIPOSA	CA
CALHOUN COUNTY TEXAS- IT DEPT.	PORT LAVACA	TX
CALIFORNIA DEPT OF FISH & GAME	BERMUDA DUNES	CA

Government Booster Users-Partial List.xls

Government Customer	City	State
CAL-NET	FORT IRWIN	CA
CAMPBELL COUNTY FIRE DEPT	GILLETTE	WY
CANADIAN RIVER MUNICIPAL	SANFORD	TX
CAPE MAY COUNTY PROSECUTERS	CAPE MAY COURT HOUSE	NJ
CAROLINE COUNTY DEPARTMENT OF	BOWLING GREEN	VA
CAVALIER COUNTY EMERGENCY	LANGDON	ND
CBP OIT	YUMA	AZ
CENTRAL UTAH WATER	OREM	UT
CHEMEKETA COMMUNITY COLLEGE	SALEM	OR
CHEROKEE COUNTY EMERGENCY MGMT	GAFFNEY	SC
CITY OF AMARILLO	AMARILLO	TX
CITY OF BEAVER	BEAVER	UT
CITY OF BOAZ	BOAZ	AL
CITY OF BOONEVILLE	BOONEVILLE	KY
CITY OF BROWNWOOD, TX	BROWNWOOD	TX
CITY OF CANADICE	SPRINGWATER	NY
CITY OF CONROE	CONROE	TX
CITY OF CYPRESS POLICE DEPT	CYPRESS	CA
CITY OF DAISETTA	DAISETTA	TX
CITY OF DANIA BEACH	DANIA	FL
CITY OF EASTLAKE POLICE DEPT	WILLOUGHBY	OH
CITY OF FAIRFAX FIRE & RESCUE	BERKELEY SPRINGS	WV
CITY OF FAIRFAX FIRE DEPT.	FAIRFAX	VA
CITY OF FLOWER MOUND	FLOWER MOUND	TX
CITY OF HENDERSON	HENDERSON	NV
CITY OF KENT, WASHINGTON	KENT	WA
CITY OF KILEEN TEXAS	KILLEEN	TX
CITY OF KINGSTON POLICE DEPT.	KINGSTON	NY
CITY OF MAPLE GROVE	MAPLE GROVE	MN
CITY OF OAK FOREST	OAK FOREST	IL
CITY OF PERRY	BRIGHAM CITY	UT
CITY OF PERRYSBURG	PERRYSBURG	OH
CITY OF PORTLAND-FIRE & RESCUE	PORTLAND	OR
CITY OF ROCHESTOR HILLS	ROCHESTER	MI
CITY OF RUSSELLVILLE	RUSSELLVILLE	AL
CITY OF SAN ANTONIO	SAN ANTONIO	TX
CITY OF SCOTTSDALE	SCOTTSDALE	AZ
CITY OF SIERRA VISTA	SIERRA VISTA	AZ
CITY OF TAMPA	TAMPA	FL
CITY OF WADSWORTH POLICE DEPT	WADSWORTH	OH
CITY OF WAUKEGAN	WAUKEGAN	IL
CITY OF WEST MONROE	WEST MONROE	LA
CITY OF WOODBURY	SAINT PAUL	MN
CLARK COUNTY AIR QUALITY	LAS VEGAS	NV
CLARK COUNTY FIRE DISTRICT 11	BATTLE GROUND	WA
CNSI- GOVERNMENT CONTRACTOR	ROCKVILLE	MD
COAST GUARD AUXILLARY	CHAPEL HILL	NC
COCHISE COUNTY SHERIFF'S OFFIC	BISBEE	AZ
COLORADO DEPT OF TRANSPORTATIO	PUEBLO	CO
COLORADO DIVISION OF WILDLIFE	DENVER	CO
COLQUITT CO BOARD OF COMMISS	MOULTRIE	GA
COLUMBUS AFB FIRE DEPARTMENT	COLUMBUS	MS
COMMON WEALTH OF KENTUCKY	FRANKFORT	KY
COMSUDRON-11	SAN DIEGO	CA

Government Booster Users-Partial List.xls

Government Customer	City	State
COUNTY OF BURLINGTON	WESTAMPTON	NJ
COUNTY OF HUNTERDON	FLEMINGTON	NJ
CPS ENERGY	SAN ANTONIO	TX
CROCKETT COUNTY EMERGENCY	ALAMO	TN
CROTON-ON-HUDSON FIRE DEPT	CROTON ON HUDSON	NY
CROW TRIBE OF INDIANS	CROW AGENCY	MT
CTUIR UMAITILLA INDIANS	PENDLETON	OR
CWI- WIRELESS SERVICES	IDAHO FALLS	ID
DAGGETT COUNTY POLICE	MANILA	UT
DAMMERON VALLEY FIRE DEPT.	DAMMERON VALLEY	UT
DAVIS SCHOOL DISTRICT	CLEARFIELD	UT
DE SOTO PARISH SHERIFF'S OFFIC	MANSFIELD	LA
DECATUR SCHOOL DISTRICT	DECATUR	AR
DEFENSE CRIMINAL INV. SERVICE	ARLINGTON	VA
DEFENSE LOGISTIC AGENCY	PORTSMOUTH	VA
DEFENSE MEDIA ACTIVITY	NORFOLK	VA
DENVER FIRE DEPARTMENT	DENVER	CO
DEP	TALLAHASSEE	FL
DEPARTMENT OF INTERIOR	HEREFORD	AZ
DEPARTMENT OF INTERIOR	PAICINES	CA
DEPARTMENT OF INTERIOR	LEWISTOWN	MT
DEPARTMENT OF INTERIOR	ALBUQUERQUE	NM
DEPARTMENT OF INTERIOR	CEDAR CITY	UT
DEPARTMENT OF INTERIOR	RICHLAND	WA
DEPARTMENT OF INTERIOR BIA	MUSKOGEE	OK
DEPARTMENT OF JUSTICE	HELENA	MT
DEPT OF DEFENSE- FINANCIAL	INDIANAPOLIS	IN
DEPT OF FISH & GAME	PETALUMA	CA
DEPT OF HOMELAND SECURITY	OAKDALE	LA
DEPT OF HOMELAND SECURITY	SAN ANGELO	TX
DEPT OF HOMELAND SECURITY	ALEXANDRIA	VA
DEPT OF HOMELAND SECURITY	BLUEMONT	VA
DEPT OF HOMELAND SECURITY	CHESAPEAKE	VA
DEPT OF HOMELAND SECURITY	LORTON	VA
DEPT OF INTERIOR (DIST III)	PHOENIX	AZ
DEPT. OF HOMELAND SECURITY	GLYNCO	GA
DHS ICE	ATLANTA	GA
DHS US BORDER PATROL	EL PASO	TX
DHS/ US CUSTOMS AND BORDER	SPOKANE	WA
DIV OF FORESTRY, FIRE & STATE	SALT LAKE CITY	UT
DOD- FORT POLK	FORT FOLK	LA
DOD-SATELLITE OFFICE/TOLL OFF	PHOENIX	AZ
DOUGLAS COUNTY	LAWRENCE	KS
DOUGLAS COUNTY EMERGENCY MGMT	LAWRENCE	KS
DOWNERS GROVE FIRE DEPT	DOWNERS GROVE	IL
DUGWAY FIRE DEPARTMENT	DUGWAY	UT
DULCE INDEPENDENT SCHOOLS	DULCE	NM
DUNDEE POLICE DEPARTMENT	DUNDEE	FL
DYNCORP-INTERNATIONAL	LAS VEGAS	NV
E-470 PUBLIC HIGHWAY AUTHORITY	AURORA	CO
EAST BAY MUNICIPAL UTILITY DST	ORLINDA	CA
EAST CENTRAL SCHOOL DIST #2580	FINLAYSON	MN
EAST WAYNE COUNTY	GREENVILLE	MO
EASTERN RANDOLPH RURAL	MOBERLY	MO

Government Booster Users-Partial List.xls

Government Customer	City	State
EBBITS PASS FIRE DIST.	ARNOLD	CA
EG&G DEFENSE MATERIALS INC	GERMANTOWN	MD
EL MALPAIS MONUMENT	GRANTS	NM
EL PASO WATER UTILITIES	EL PASO	TX
EPA - ERRB	ATLANTA	GA
ESU KODIAK US COAST GUARD	KODIAK	AK
EVANS ARMY COMMUNITY HOSPITAL	COLORADO SPRINGS	CO
EVANSTON POLICE DEPARTMENT	EVANSTON	IL
F.B.I.	JACKSON	MS
F.B.I. / HMRU	QUANTICO	VA
F.B.I. -SPRINGFIELD	SPRINGFIELD	IL
FAA/CMEL	PALM COAST	FL
FAIRBANKS AIRPORT FIRE& POLICE	FAIRBANKS	AK
FAIRMOUNT-FIRE PROTECTION DIST	GOLDEN	CO
FARIBAULT COUNTY SHERIFF'S	BLUE EARTH	MN
FBI	SEATTLE	WA
FBI ACADEMY	QUANTICO	VA
FCC	HIRAM	GA
FEDERAL AVIATION ADMIN (FAA)	PENSACOLA	FL
FEDERAL AVIATION ADMINISTRATIO	FORT WORTH	TX
FEDERAL EMERGENCY	MADISON	WI
FEDERAL HIGHWAY ADMINISTRATION	LAKEWOOD	CO
FEDERAL RAILROAD ADMIN.	CHICAGO	IL
FISH & WILDLIFE CONS. COMM.	WEST PALM BEACH	FL
FLORIDA DEPT OF HEALTH	TALLAHASSEE	FL
FLORIDA EAST COAST RAILWAY	JACKSONVILLE	FL
FLORIDA FISH & WILDLIFE	LAKE CITY	FL
FLORIDA FISH & WILDLIFE	TALLAHASSEE	FL
FLORIDA KEYS AQUEDUCT AUTH.	KEY WEST	FL
FLORIDA STATE LEGISTRATOR	TALLAHASSEE	FL
FLORIDA STATE PARKS	BOKEELIA	FL
FOUR MILE FIRE PROTECTION DIST	FLORISSANT	CO
FRANKLIN-BINGHAM FIRE DEPT.	FRANKLIN	MI
GALVESTON COUNTY AUTO CRIMES	GALVESTON	TX
GANADO ISD SCHOOL DISTRICT	GANADO	TX
GARFIELD CNTY SHERIFF'S OFFICE	GLENWOOD SPRINGS	CO
GENOA TOWNSHIP	BRIGHTON	MI
GEORGIA CORRECTIONAL INDUSTRIE	DECATUR	GA
GEORGIA DEPT OF TECHNICAL &	ATLANTA	GA
GEORGIA FORESTRY COMMISSSION	MACON	GA
GLADES COUNTY SHERIFF OFFICE	MOORE HAVEN	FL
GLENBARD TOWNSHIP SCHOOL	GLEN ELLYN	IL
GRAND CANYON NATIONAL PARK	GRAND CANYON	AZ
GRAND COUNTY EMS	HOT SULPHUR SPRINGS	CO
GRANDVIEW POLICE DEPARTMENT	GRANDVIEW	MO
GRANITE CITY POLICE DEPARTMENT	GRANITE CITY	IL
GRASS RANGE SCHOOL DISTRICT 27	GRASS RANGE	MT
GREENVILLE COUNTY SCHOOL DIST	TAYLORS	SC
GREENWOOD EMERG. MANAGEMENT	GREENWOOD	SC
GULF ISLANDS NATIONAL SEASHORE	GULF BREEZE	FL
HALLSDALE POWELL UTILITY DIST	KNOXVILLE	TN
HAMILTON COUNTY GOVERNMENT	HIXSON	TN
HANOVER POLICE	HANOVER	NH
HARDEE COUNTY SHERIFF'S DEPT.	WAUCHULA	FL

Government Booster Users-Partial List.xls

Government Customer	City	State
HARRISON & LEWIS CO DRUG ENFOR	BRIDGEPORT	WV
HEART OF TEXAS AUTO THEFT	WACO	TX
HEBO RANGER DIST USFS	HEBO	OR
HEMPHILL CTY SHERIFF'S OFFICE	CANADIAN	TX
HETCO	APO	AE
HIGHLAND SCHOOL DISTRICT	HARDY	AR
HIGHLANDS COUNTY FIRE SERVICES	SEBRING	FL
HOMELAND SECURITY	CLEVELAND	TX
HQ AFWA / SCHS	OFFUTT A F B	NE
HRECC	HARRISONBURG	VA
HUDSON ISD	LUFKIN	TX
HUNTINGTON FIRE & RESCUE	HUNTINGTON	OR
HUNTINGTON PARK POLICE DEPT.	HUNTINGTON PARK	CA
IDAHO STATE POLICE	MERIDIAN	ID
IDAHO TRANSPORTATION DEPART.	POCATELLO	ID
ILDNR LAW ENFORCEMENT	SPRINGFIELD	IL
ILLINOIS NATIONAL GUARD	SPRINGFIELD	IL
ILLINOIS STATE POLICE	SPRINGFIELD	IL
IMMIGRATION & CUSTOMS ENFORCE	WASHINGTON	DC
IMMIGRATION & CUSTOMS ENFORCEM	IRVING	TX
IMPERIAL NATIONAL WILDLIFE REF	YUMA	AZ
INDEPENDENT SCHOOL DIST #16	SPRING LAKE PARK	MN
IREDELL CO SHERIFF'S OFFICE	STATESVILLE	NC
IREDELL-STATESVILLE SCHOOLS	STATESVILLE	NC
IRON COUNTY - FIRE DEPT	PAROWAN	UT
IRON COUNTY ITS	PAROWAN	UT
ISLAND COUNTY	COUPEVILLE	WA
JACKSON COUNTY COMMUNITY	GAINESBORO	TN
JACKSON PARISH SHERIFF'S OFFIC	JONESBORO	LA
JEFFERSON COUNTY SHERIFF'S OFF	MADRAS	OR
JOHN DAY INTERAGENCY DISPATCH	JOHN DAY	OR
JUDGE DENNIS J. BOLL GROUP	IRONTON	OH
JUNEAU POLICE DEPARTMENT	JUNEAU	AK
KANE COUNTY SHERIFF	GENEVA	IL
KANE COUNTY WATER CONS. DIST.	KANAB	UT
KANSAS AIR NATIONAL GUARD	SALINA	KS
KENAI PENINSULA BOROUGH	SOLDOTNA	AK
KING GEORGE SHERIFF'S OFFICE	KING GEORGE	VA
KISATCHIE NATIONAL FOREST	PINEVILLE	LA
KITSAP COUNTY DEM	BREMERTON	WA
KLEBERG COUNTY OEM, TEXAS	KINGSVILLE	TX
L A COUNTY SANITATION DISTRICT	WHITTIER	CA
LA PORTE CTY SHERIFF'S OFFICE	LA PORTE	IN
LAKE COUNTY LOCAL GOVERNMENT	POLSON	MT
LAKE VIEW POLICE DEPT	LAKE VIEW	AL
LARIMER COUNTY	FORT COLLINS	CO
LARIMER COUNTY-FLEET SERVICES	FORT COLLINS	CO
LAS VEGAS UNITED REACT	LAS VEGAS	NV
LAWRENCE COUNTY FISCAL COURT	LOUISA	KY
LEADVILLE LAKE COUNTY	LEADVILLE	CO
LEE CO. SHERIFF'S OFFICE	FORT MYERS	FL
LEEDS FIRE DEPARTMENT	LEEDS	UT
LEXINGTON COUNTY SCHOOL DIST.	LEXINGTON	SC
LINCOLN COLONY SHERIFF'S DEPT.	MERRILL	WI

Government Booster Users-Partial List.xls

Government Customer	City	State
LOGAN COUNTY PARAMEDICS	LINCOLN	IL
LOUISIANA SHERIFFS TASK FORCE	BATON ROUGE	LA
LOWNAM RANGER STATION	LOWMAN	ID
LUNENBURG COUNTY SHERIFF DEPT	LUNENBURG	VA
LVMPD	HENDERSON	NV
LYON COUNTY SCHOOL DISTRICT	YERINGTON	NV
MACON COUNTY SHERIFF'S DEPT	LAFAYETTE	TN
MADIGAN ARMY MEDICAL CENTER	TACOMA	WA
MADISON PARISH --OFFICE OF	TALLULAH	LA
MAHASKA HEALTH PARTNERSHIP	OSKALOOSA	IA
MARINE CORPS AIR STATION	YUMA	AZ
MARION COUNTY EMERGENCY MGMT	MARION	KS
MARQUETTE COUNTY SHERRIFFS	MARQUETTE	MI
MAURY COUNTY SHERIFF'S DEPT.	COLUMBIA	TN
MCAAP	MCALESTER	OK
MCCLAIN COUNTY LOCAL	PURCELL	OK
MD DEPT HEALTH & MENTAL HYGIEN	BALTIMORE	MD
MENDOCINO COUNTY SHERIFF'S OFF	UKIAH	CA
MICHIGAN STATE UNIVERSITY	EAST LANSING	MI
MIFFLIN COUNTY	LEWISTOWN	PA
MILLARD COUNTY SHERIFFS OFFICE	FILLMORE	UT
MISSOURI DEPT OF NATURAL RESOR	ROLLA	MO
MODOC FOREST SERVICE	ALTURAS	CA
MONTANA ARMY NATIONAL GUARD	FORT HARRISON	MT
MONTANA FISH, WILDLIFE & PARKS	CHOTEAU	MT
MONTANA STATE	LEWISTOWN	MT
MONTGOMERY CO. ELECTION COMMIS	CLARKSVILLE	TN
MONTGOMERY CTY GOVERNMENT	ROCKVILLE	MD
MORGAN COUNTY SHERIFF'S DEPT	MARTINSVILLE	IN
MORROW COUNTY PUBLIC WORKS	LEXINGTON	OR
MOUNTAIN BOCES SCHOOL DISTRICT	LEADVILLE	CO
MSHA US DEPT OF LABOR	PITTSBURGH	PA
MT SAN ANTONIO COLLEGE	WALNUT	CA
MT. HOOD NATIONAL FOREST	SANDY	OR
MWR-APIS-APOSTLE ISLANDS	BAYFIELD	WI
N.P.S. - CHIRICAHUA NATIONAL	WILLCOX	AZ
NATIONAL PARK SERVICE	TUCSON	AZ
NATIONAL PARK SERVICE	POINT REYES	CA
NATIONAL PARK SERVICE	THREE RIVERS	CA
NATIONAL PARK SERVICE	TULELAKE	CA
NATIONAL PARK SERVICE	TWENTYNINE PALMS	CA
NATIONAL PARK SERVICE	INTERIOR	SD
NATIONAL PARK SERVICE/ LAW ENF	POINT REYES STATION	CA
NATIONAL PARK SERVICES	EL PORTAL	CA
NATIONAL PARK SERVICES	DENVER	CO
NATRONA COUNTY	CASPER	WY
NAVAL AIR WARFARE CENTER	CHINA LAKE	CA
NAVAL SURFACE WARFARE CENTER	BETHESDA	MD
NAWCAD US NAVY	SAINT INIGOES	MD
NEBRASKA NATIONAL GUARD	LINCOLN	NE
NEVADA AIR NATIONAL GUARD	RENO	NV
NEVADA COUNTY CONSOLID FIRE	GRASS VALLEY	CA
NEW KENT COUNTY	NEW KENT	VA
NEW YORK CITY PARKS & REC	NEW YORK	NY

Government Booster Users-Partial List.xls

Government Customer	City	State
NEW YORK CITY TRANSIT	NEW YORK	NY
NEWPORT BEACH POLICE DEPT	NEWPORT BEACH	CA
NH DEPT OF TRANSPORTATION	CONCORD	NH
NOLAN COUNTY SHERIFF'S OFFICE	SWEETWATER	TX
NORTH DAKOTA STATE UNIVERSITY	MINOT	ND
NORTH LAKE TAHOE FIRE PROTECTI	INCLINE VILLAGE	NV
NORTH STERLING STATE PARK	STERLING	CO
NORTH VERMILLION HIGH SCHOOL	CAYUGA	IN
NORTH WHATCOM FIRE & RESCUE	BLAINE	WA
NORTHEAST SERVICE CORP.	MOUNTAIN IRON	MN
NORTHSHORE FIRE DEPARTMENT	KENMORE	WA
NOVA CIGARETTE TAX BOARD	FAIRFAX	VA
OHIO AIR NATIONAL GUARD	SPRINGFIELD	OH
OKLAHOMA STATE DEPT. OF HEALTH	OKLAHOMA CITY	OK
OLYMPIC NATIONAL PARK	PORT ANGELES	WA
ORANGE COUNTY	MIDDLETOWN	NY
ORANGE CTY SANITATION DISTRICT	FOUNTAIN VALLEY	CA
OREGON STATE POLICE	SALEM	OR
OREGON STATE UNIVERSITY	CORVALLIS	OR
ORGAN PIPE CACTUS NATIONAL	AJO	AZ
PADRE ISLAND NATIONAL SEASHORE	CORPUS CHRISTI	TX
PARKSLEY VOLUNTEER FIRE	PARKSLEY	VA
PAYETTE NATIONAL FOREST	NEW MEADOWS	ID
PEMBINA COUNTY EMERGENCY MNGMT	CAVALIER	ND
PIKEVILLE MEDICAL CENTER, INC	PIKEVILLE	KY
PITTSBURGH PUBLIC SCHOOLS	PITTSBURGH	PA
PLACER COUNTY SHERIFFS DEPT	AUBURN	CA
PLAQUEMINES-PARISH GOVERNMENT	BELLE CHASSE	LA
PORT WASHINGTON UFSD	PORT WASHINGTON	NY
PRICE COUNTY HIGHWAY DEPT	PHILLIPS	WI
PRINCE GEORGE COUNTY	PRINCE GEORGE	VA
PRINCETON PUBLIC SCHOOLS -ISD	PRINCETON	MN
PSO GSA	SPRINGFIELD	VA
QUANTICO FIRE DEPARTMENT	QUANTICO	VA
RANCHO CUCAMONGA FIRE FIGHTERS	RANCHO CUCAMONGA	CA
RAY COUNTY AMBULANCE DISTRICT	RICHMOND	MO
RAYTOWN POLICE DEPT.	RAYTOWN	MO
RED RIVER CLERK OF COURT	COUSHATTA	LA
RED RIVER PARISH AMBULANCE SVC	COUSHATTA	LA
RED RIVER PARISH CONSTABLE OFF	COUSHATTA	LA
RED RIVER SHERIFF'S OFFICE	COUSHATTA	LA
REDDING POLICE DEPARTMENT	REDDING	CT
REDWOOD CITY FIRE DEPARTMENT	REDWOOD CITY	CA
ROCHESTER CITY LINES	ROCHESTER	MN
ROCKY MOUNTAIN NAT'L PARK	ESTES PARK	CO
ROWAN COUNTY SHERIFFS OFFICE	SALISBURY	NC
ROXANA VOLUNTEER FIRE COMPANY	ROXANA	DE
RUTHERFORD CTY BOARD OF EDUC.	MURFREESBORO	TN
SACRAMENTO COUNTY AIRPORT	SACRAMENTO	CA
SAN JUAN CO FIRE DEPT DIST 4	LOPEZ ISLAND	WA
SAN MIGUEL COUNTY- IT DEPT.	NORWOOD	CO
SANDIA NATIONAL LABORATORIES	ALBUQUERQUE	NM
SANTEE COOPER-PURCHASING	MONCKS CORNER	SC
SCHOOL ADMINISTRATIVE UNIT 56	SOMERSWORTH	NH

Government Booster Users-Partial List.xls

Government Customer	City	State
SEMINOLE TRIBE OF FLORIDA	PEMBROKE PINES	FL
SHEFFIELD VILLAGE FIRE DEPT	SHEFFIELD LAKE	OH
SHERBURNE NATIONAL WILDLIFE	ZIMMERMAN	MN
SMITH COUNTY	CARTHAGE	TN
SMOKEY HILLS	SALINA	KS
SOCIAL SECURITY ADMIN - MO	CREVE COEUR	MO
SOMERSWORTH HIGH SCHOOL	SOMERSWORTH	NH
SOUTHEASTERN OHIO JOINT SOLID	CALDWELL	OH
SOUTHERN OKLAHOMA TECH. CNTR	ARDMORE	OK
SOUTHGATE SANITATION DIST.	CENTENNIAL	CO
SOUTHWEST TELLER COUNTY -EMS	CRIPPLE CREEK	CO
SOUTHWESTERN REGIONAL POLICE	SPRING GROVE	PA
STATE OF ALASKA	JUNEAU	AK
STATE OF CA-DEPT OF TRANSP.	SAN BERNARDINO	CA
STATE OF CALIFORNIA	RAMONA	CA
STATE OF IDAHO DEPARTMENT	BOISE	ID
STATE OF ILLINOIS	SPRINGFIELD	IL
STATE OF MAINE	AUGUSTA	ME
STATE OF NE DEPT OF ROADS	LINCOLN	NE
STATE OF OREGON D.E.Q.	PORTLAND	OR
STATE OF WISCONSIN	MADISON	WI
STATE OF WYOMING	CHEYENNE	WY
STONE BANK FIRE DEPT	OCONOMOWOC	WI
STRATFORD FIRE DEPARTMENT	STRATFORD	CT
SUN PRAIRIE WATER AND POWER	SUN PRAIRIE	WI
TECHNICAL OPERATIONS UNIT	COLUMBUS	OH
TEXAS PARKS & WILDLIFE	AUSTIN	TX
THETFORD POLICE	THETFORD CENTER	VT
THURSTON COUNTY CENTRAL SERV	OLYMPIA	WA
TONTO NATIONAL FOREST	MESA	AZ
TOWN IF PIERMONT, NH/FIRE DEPT	PIERMONT	NH
TOWN OF CARLISLE - FIRE DEPT	CARLISLE	MA
TOWN OF EAST HAMPTON	WAINSCOTT	NY
TOWN OF MILFORD	MILFORD	NH
TOWN OF MILTON	MILTON	NH
TOWN OF PARAGON	PARAGON	IN
TOWN OF SILVERTON	SILVERTON	CO
TOWN OF WESTFORD	WESTFORD	MA
TOWN OF WESTWOOD - SEWER DEPT	WESTWOOD	MA
TOWNSHIP OF BORDENTOWN	BORDENTOWN	NJ
TRANSP. & NATURAL RESOURCES	AUSTIN	TX
TVA TENNESSEE VALLEY AUTHORITY	RESACA	GA
TVA-TENNESSEE VALLEY AUTHORITY	MUSCLE SHOALS	AL
TVA-TENNESSEE VALLEY AUTHORITY	SPRING HILL	TN
U S ARMY CORPS OF ENGINEERS	SAULT SAINTE MARIE	MI
U. S. A. C. E.	JUSTICE	WV
U. S. A. C. E.	SUTTON	WV
U.S. DEPT OF HOMELAND SECURITY	NORTH CHARLESTON	SC
U.S. FOREST SERVICE	MCCLELLAN	CA
U.S. FOREST SERVICE	COUNCIL	ID
U.S. NAVY	GROTON	CT
U.S. NAVY AIR WORKERS	PATUXENT RIVER	MD
U.S. NAVY SUBMARINE GROUP 9	SILVERDALE	WA
U.S.F.S.CIBOLA NATIONAL FOREST	SANTA FE	NM

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Government Customer	City	State
UINTAH COUNTY POLICE DEPT	VERNAL	UT
UMATILLA COUNTY	PENDLETON	OR
UNICOR LA TUNA, FEDERAL PRISON	BUTNER	NC
UNIVERSITY OF SOUTH FLORIDA	TAMPA	FL
UNIVERSITY OF TEXAS AT AUSTIN	AUSTIN	TX
UNIVERSTIY OF COLORADO-BOULDER	BOULDER	CO
US AIR FORCE	MERCURY	NV
US AIR FORCE- 90 SECURITY	FE WARREN AFB	WY
US AIR FORCE-DFSA ROME(S09076)	ROME	NY
US ARMY - CORPS OF ENGINEERS	LOWELL	OR
US ARMY - SSCOMM	NATICK	MA
US ARMY 3RD/337 4TH CAV	FORT KNOX	KY
US ARMY BRAVO CO 1ST BATTALION	FORT CAMPBELL	KY
US ARMY CORP OF ENGINEERS	LOUISVILLE	KY
US ARMY CORPS OF ENGINEERING	BURNSVILLE	WV
US ARMY CORPS OF ENGINEERS	ARKADELPHIA	AR
US ARMY CORPS OF ENGINEERS	MOUNTAIN HOME	AR
US ARMY CORPS OF ENGINEERS	MURFREESBORO	AR
US ARMY CORPS OF ENGINEERS	GREENUP	KY
US ARMY CORPS OF ENGINEERS	VICKSBURG	MS
US ARMY CORPS OF ENGINEERS	PIERRE	SD
US ARMY CORPS OF ENGINEERS	CARTHAGE	TN
US Army Director of Logistics	Fort Sill	OK
US ARMY- HQ 1ST BRIGADE COMBAT	FORT BRAGG	NC
US ARMY MEDICAL TASK FORCE	CAMP SHELBY	MS
US ARMY RESERVE	AUGUSTA	GA
US ARMY SPACE AND	HUNTSVILLE	AL
US ARMY YUMA PROVING GROUNDS	YUMA	AZ
US ARMY-FORT CAMPBELL/BRAVO CO	FORT CAMPBELL	KY
US BORDER PATROL	NOYES	MN
US BORDER PATROL	EDINBURG	TX
US BUREAU OF RECLAMATION	FOLSOM	CA
US BUREAU OF RECLAMATION	PROVO	UT
US BUREAU RECLAMATION	FARMINGTON	NM
US COAST GUARD	MOBILE	AL
US COAST GUARD	ALAMEDA	CA
US DEPT OF AGRICULTURE	MONTE VISTA	CO
US DEPT OF DEFENSE	FORT GEORGE G MEADE	MD
US DEPT OF HOMELAND SECURITY	KANSAS CITY	MO
US DEPT OF HOMELAND SECURITY	ALTOONA	PA
US DEPT OF INTERIOR - NATIONAL	VESUVIUS	VA
US DEPT OF JUSTICE	ANNAPOLIS JUNCTION	MD
US DEPT OF STATE - RAO	WASHINGTON	DC
US DEPT. OF AGRICULTURE	ALPINE	CA
US DEPT. OF INTERIOR - NPS	MARBLE CANYON	AZ
US DEPT. OF THE INTERIOR	LOVELAND	CO
US DOI- OFFICE OF SURFACE MINI	BIG STONE GAP	VA
US EPA	BRUNSWICK	GA
US EPS - REGION 10	SEATTLE	WA
US FISH & WILDLIFE	COLUMBIA	NC
US FISH & WILDLIFE	BRUNSWICK	VT
US FISH & WILDLIFE SERVICE	SASABE	AZ
US FISH & WILDLIFE SERVICES	KENMARE	ND
US FISH AND WILDLIFE SERVICE	JACKSONVILLE	FL

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Government Customer	City	State
US FOREST FIRE SERVICE	FORESTHILL	CA
US FOREST SERVICE	ALPINE	AZ
US FOREST SERVICE	MESA	AZ
US FOREST SERVICE	NOGALES	AZ
US FOREST SERVICE	BIG BAR	CA
US FOREST SERVICE	BURNT RANCH	CA
US FOREST SERVICE	GLENDORA	CA
US FOREST SERVICE	KING CITY	CA
US FOREST SERVICE	PLACERVILLE	CA
US FOREST SERVICE	RAMONA	CA
US FOREST SERVICE	REDDING	CA
US FOREST SERVICE	SANTA BARBARA	CA
US FOREST SERVICE	DURANGO	CO
US FOREST SERVICE	CLARKESVILLE	GA
US FOREST SERVICE	MISSOULA	MT
US FOREST SERVICE	COLUMBIA	SC
US FOREST SERVICE	ENTIAT	WA
US FOREST SERVICE CASE SPRINGS	MURRIETA	CA
US FOREST SERVICE- ENGINGE 32	PRESCOTT	AZ
US FOREST SERVICE/ TONTO NAT.	ROOSEVELT	AZ
US FOREST SERVICE/MCCALL	MC CALL	ID
US FOREST SERVICE-AGRICULTURE	GREYBULL	WY
US GEOLOGICAL SURVEY	DENVER	CO
US GEOLOGICAL SURVEY CA	SACRAMENTO	CA
US GEOLOGICAL SURVEY-WATER	SACRAMENTO	CA
US HOUSE OF REPRESENTATIVES	WASHINGTON	DC
US MARSHALS SERVICE	PINEVILLE	LA
US MARSHALS SERVICE	SIOUX FALLS	SD
US NAVAL ACADEMY	ANNAPOLIS	MD
US NAVY DEPT OF PUBLIC SAFTEY	PATUXENT RIVER	MD
US NAVY SUBMARINE SQUADRON 11	SAN DIEGO	CA
US NAVY- USNS SALVOR	PEARL CITY	HI
US NAVY-PORT OPERATIONS	PANAMA CITY BEACH	FL
US PROBATION	MISSOULA	MT
USACE ENGINEERING & CONSTRUCTI	TULSA	OK
USAF- 844 CS/ET	ARLINGTON	VA
USBR/DOI	DENVER	CO
USDA APHIS	ALBUQUERQUE	NM
USDA FOREST SERVICE	SUSANVILLE	CA
USDA FOREST SERVICE	TULELAKE	CA
USDA FOREST SERVICE	DELTA	CO
USDA FOREST SERVICE	CRAWFORDVILLE	FL
USDA FOREST SERVICE	UMATILLA	FL
USDA FOREST SERVICE	GARDEN VALLEY	ID
USDA FOREST SERVICE	ESCANABA	MI
USDA FOREST SERVICE	BILLINGS	MT
USDA FOREST SERVICE	RESERVE	NM
USDA FOREST SERVICE	MEDFORD	OR
USDA FOREST SERVICE	UKIAH	OR
USDA FOREST SERVICE	RHINELANDER	WI
USDA FOREST SERVICE	MORGANTOWN	WV
USDA FOREST SERVICE -PRESCOTT	PRESCOTT	AZ
USDA FOREST SERVICE/REGION SIX	PORTLAND	OR
USDA LASSEN NAT'L FOREST	SUSANVILLE	CA

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Government Customer	City	State
USDA PAYETTE NATIONAL FOREST	WEISER	ID
USDA VETERINARY SERVICES	MADISON	WI
USDA WILDLIFE SERVICES	MISSISSIPPI STATE	MS
USDA/APHIS/WILDLIFE SERVICES	SAINT PAUL	MN
USDA-SHOSHONE NATIONAL FOREST	DUBOIS	WY
USDE-BONNEVILLE POWER ADMINIST	OLYMPIA	WA
USDOIBLM BURNS DISTRICT	HINES	OR
VANDENBERG AFB	VANENBURG AFB	CA
VANDENBERG AFB FIRE DEPT	VAFB	CA
VERMONT STATE POLICE	WELLS	VT
VILLAGE OF DANNEBROG	DANNEBROG	NE
VIRGINIA BEACH SHERIFFS OFFICE	VIRGINIA BEACH	VA
VIRGINIA NATIONAL GUARD	BLACKSTONE	VA
VIRGINIA NATIONAL GUARD	SANDSTON	VA
WAKULLA COUNTY	CRAWFORDVILLE	FL
WARD COUNTY-HIGHWAY DEPT	MINOT	ND
WASATCH SCHOOL DISTRICT	HEBER CITY	UT
WASH CO SHERIFF'S OFFICE	CHIPLEY	FL
WASHINGTON CITY	WASHINGTON	UT
WASHINGTON COUNTY ROAD DIV	SAINT GEORGE	UT
WASHINGTON COUNTY SCHOOL DIST.	ST GEORGE	UT
WASHINGTON COUNTY SHERIFF	HURRICANE	UT
WASHINGTON COUNTY, VIRGINIA	ABINGDON	VA
WASHINTON COUNTY	SAINT GEORGE	UT
WAYNE COUNTY SHERIFF'S OFFICE	WAYNESBORO	TN
WEBSTER PARISH SHERIFF'S OFFIC	MINDEN	LA
WEST SIDE FIRE DEPARTMENT	BIVALVE	MD
WEST VA DEPT OF COMMERCE	CHARLESTON	WV
WEST VIRGINIA STATE POLICE	SO. CHARLESTON	WV
WESTERN AREA POWER ADMIN - DOE	HURON	SD
WESTERN AREA POWER ADMIN.	MONTROSE	CO
WESTMORELAND CO DEPT SOC SVC	MONTROSS	VA
WHATCOM COUNTY FIRE DIST. NO 7	FERNDALE	WA
WHATCOM CTY FIRE DISTRICT 4	BELLINGHAM	WA
WILLARD BAY STATE PARK	WILLARD	UT
WILLIAM J HUGHES TECH CNTR-FAA	EGG HARBOR CITY	NJ
WINN PARISH FIRE DEPARTMENT	WINNFIELD	LA
WINNEBAGO CO. SHERIFF'S OFFICE	ROCKFORD	IL
WINNEBAGO COUNTY- IT DEPT	ROCKFORD	IL
WISCONSIN DEPARTMENT OF	RHINELANDER	WI
WISCONSIN DEPT EMERGENCY MGMT	MADISON	WI
WISCONSIN DEPT OF NATL RESOURC	SPOONER	WI
WYLE LABORATORIES	RIDGECREST	CA
WYOMING WORKFORCE SERVICES	EVANSTON	WY
YALOBUSHA COUNTY	WATER VALLEY	MS
YAVAPAI COUNTY SHERIFF OFFICE	PRESCOTT	AZ
YELLOWSTONE NATIONAL PARK NPS	YELLOWSTONE NATL PK	WY
YELLOWSTONE NATL PARK	WEST YELLOWSTONE	MT
YELLOWSTONE PARK SERVICE	GARDINER	MT
YORKVILLE COMMUNITY	YORKVILLE	IL
YOSEMITE NATIONAL PARK	GROVELAND	CA

LUKAS, NACE,
GUTIERREZ & SACHS, LLP

8300 GREENSBORO DRIVE, SUITE 1200
MCLEAN, VIRGINIA 22102
703 584 8678 • 703 584 8696 FAX

WWW.FCCLAW.COM

RUSSELL D. LUKAS
DAVID L. NACE
THOMAS GUTIERREZ*
ELIZABETH R. SACHS*
DAVID A. LAFURIA
PAMELA L. GIST
TODD SLAMOWITZ*
TODD B. LANTOR*
STEVEN M. CHERNOFF*
KATHERINE PATSAS NEVITT*

CONSULTING ENGINEERS
ALI KUZEHKANANI
LEILA REZANAVAZ

OF COUNSEL
GEORGE L. LYON, JR.
LEONARD S. KOLSKY*
JOHN CIMKO*
J. K. HAGE III*
JOHN J. MCAVOY*
HON. GERALD S. MCGOWAN*
TAMARA DAVIS BROWN*

*NOT ADMITTED IN VA

SIGNAL BOOSTERS AND THE LAW

THE DISPUTE

CTIA and AT&T claim that a wireless subscriber in good standing cannot use a device to amplify the signal to and from his/her handset to ensure reliable service unless the subscriber has obtained the authorization of the licensed wireless service provider. They contend that wireless service providers should have the unbridled authority to set the standards by which signal amplification devices can be approved for use by their subscribers and thereby dictate the devices that can be marketed to consumers. CTIA contradicts its contention that the Commission's rules already bestow such authority on wireless carriers by asking for a declaratory ruling to that effect.

Wilson maintains that subscribers have the right to use signal boosters to enhance their wireless service if the devices do not interfere with wireless network operations or adversely affect the utility of networks for other subscribers. Wilson is of the opinion that current law permits subscribers in good standing to use or operate FCC-certificated signal boosters without the consent of their wireless service providers in order to maximize their effective use of wireless networks. However, Wilson believes that the Commission must adopt equipment certification requirements to ensure that signal boosters will enhance wireless service without interfering with wireless network operations.

THE PROBLEM

The Enforcement Bureau has issued warning letters to users of in-building signal boosters that state that a licensee's authority to install an in-building radiation system does not permit a subscriber to install such a system "unless the subscriber has received explicit authorization from the licensee to do so." However, no Commission rule or regulation requires a subscriber in good standing to obtain the explicit authorization of the licensee to operate an in-building radiation system or any other FCC-certificated fixed or mobile signal booster.

By rule, the Commission will not issue individual fixed or mobile station authorizations to subscribers in the wireless radio services. Under § 1.903(c) of the rules, authority for subscribers to operate fixed or mobile stations is included in the authorization held by the licensed wireless service provider. Because signal boosters can be operated as mobile or fixed stations, a subscriber is authorized to operate a signal booster by the authorization held by the subscriber's wireless service provider subject only to the conditions that the rules

impose on the licensee's authority. Thus, subscribers that operate signal boosters are authorized to transmit on the frequencies on which the wireless system is licensed to operate.

None of the service-specific provisions of Parts 20, 22, 24 and 27 of the rules conflict with § 1.903(c). To the contrary, Part 22 contains a rule that is identical to § 1.903(c). And § 22.927 explicitly confirms that, when their mobile stations are receiving service from an authorized system, cellular subscribers in good standing are "considered to be operating under the authorization of that ... system."

The rules that currently *permit* subscribers to operate signal boosters cannot be construed or enforced to *prohibit* such operations without the consent of their wireless service providers. Enforcement of such a prohibition would violate due process because no rule or properly promulgated and published policy statement affords adequate notice to a subscriber that the operation of a signal booster without licensee consent would be unlawful.

The Enforcement Bureau appears to be enforcing a policy statement issued by the Commission in a 2005 rulemaking in which it elected not to eliminate or amend the "in-building radiator rule" of § 22.383. Noting that its staff was examining issues relating to the "appropriate regulatory treatment of wireless boosters," the Commission elected to "address § 22.383 in the context of that examination." Nevertheless, it took the "opportunity to clarify that, under our current policies, such devices may only be operated by a licensee or pursuant to the licensee's permission and control." By clarifying its "current policies," the Commission issued a non-binding policy statement. Moreover, by aborting its rulemaking with regard to § 22.383 explicitly in favor of examining the appropriate regulatory treatment of signal boosters in a subsequent proceeding, the Commission obviously did not conduct the APA rulemaking necessary to make its "clarification" have a binding effect or be enforceable as a legislative or substantive rule.

THE SOLUTION

The current rules neither empower service providers to prohibit subscribers from operating signal boosters, nor ensure that subscribers operate signal boosters that enhance the reliability of their wireless service without harming the wireless network. To resolve the dispute one way or the other, the Commission must effect a substantive change in the rules. And that requires prior compliance with the notice-and-comment rulemaking requirements of the APA. Consequently, the Commission must conduct a formal rulemaking regardless of whether it favors the carriers' interest in controlling the use of their networks or the consumers' interest in making the maximum use of those networks. In short, it must fulfill its 2005 promise to conduct a rulemaking to determine the appropriate regulatory treatment of signal boosters

The Commission recognized in 1974 that it had jurisdiction over the charges, practices, classifications or regulations of wireless service providers that affect "a subscriber's right to make beneficial use of his mobile telephone in interstate communications." The Commission should exercise its jurisdiction today to adopt equipment certification requirements that will both prevent wireless service providers from discouraging manufacturers of signal boosters

from competing in interstate commerce in radio devices and to protect the subscribers' right to make beneficial use of signal boosters that do not harm wireless networks.

ANDREWSEYBOLD

Andrew Seybold, Inc., 315 Meigs Road, A-267, Santa Barbara, CA 93109

805-898-2460 voice, 805-898-2466 fax, www.andrewseybold.com

In-Car Cellular Signal Boosters

White Paper Prepared for:

Wilson Electronics

May, 2010

Prepared by:
Andrew M. Seybold
Andrew Seybold, Inc.
315 Meigs Rd. Suite A-267
Santa Barbara, CA 93109
805-898-2460
aseybold@andrewseybold.com
www.andrewseybold.com

In-Car Cellular Signal Boosters

Executive Summary

No doubt you have experienced a dropped call while using your cellular phone in your car. You might be in a rural area, far from the nearest cell site, and distance from the cell site causes a weak signal. Or perhaps you are driving where there are hills between you and the cell site, blocking the signal. If you are in an urban area, buildings can likewise block cell signals, and entering structures such as parking garages are often sure ways to end a phone call. How many times have you warned the person to whom you are talking, "I'll call you back if I lose you here?" Cell phones are amazing devices, but cars with their metal bodies do a great job of blocking radio waves. Thus dropped and missed calls or slow data rates are all too common.

The solution to this problem is to boost or amplify the signal between the phone and the cell site. An in-car or mobile cellular signal booster consists of two components: a booster that is placed inside the car (perhaps incorporated into a cradle for the cell phone) and an antenna that is placed outside of the car. The booster amplifies both the signal that the phone receives from the cell site as well as the signal the phone transmits to the cell site. Thus the phone always has a strong signal (more "bars") and dropped calls are virtually eliminated. If your phone is using its data connection, such as with a navigation application, the rate of data downloaded to the phone will be faster.

However, designing a quality mobile cellular signal booster is not a simple matter. There are two important design principles to which any booster should adhere. It must:

1. Work as advertised for the customer.
2. Do no harm to either the network to which the cell phone is communicating or to any other nearby network.

More specifically, there are three problems to be overcome in the design of a booster.

1. Oscillation due to feedback must be avoided. If the external antenna is placed too close to the in-car cradle (which has its own internal antenna), oscillation due to feedback can occur, similar to when a microphone is placed too close to the speaker of a public address system and a howling whine comes out of the speakers. In a cell phone booster, feedback oscillation causes the system to generate noise which can interfere with nearby cell sites' ability to receive signals from other cell phones, causing disruption of service to other users.
2. Overload of the cell site with which the phone is communicating must be prevented. When you are far from the nearest cell site then the booster needs to transmit at the maximum allowable power. If you then drive close to the cell site, it must appropriately adjust itself so as not to overwhelm the cell site and avoid any type of network overload or potential interference.

3. Interference to adjacent cell sites must not occur. A more subtle variation of the previous problem occurs when your cell phone is communicating with a distant cell site, but there is another cell site (operated by a different carrier) close by. If the booster transmits a strong signal in order to reach the distant site, it could potentially interfere with the nearby cell site. This must not happen.

To our knowledge, Wilson Electronics is the only company producing cell phone boosters that adhere to these design principles. They are designed and built to avoid the problems described above.

The Wilson cell phone booster protects the network by detecting any oscillation. Within 10 milliseconds ($1/100^{th}$ of a second) the booster reduces gain (amplification) or shuts down if needed to prevent network interference.

The Wilson cell phone booster measures both the transmit signal strength from the phone and the incoming signal strength from the cell site. It uses these measurements to determine how close the phone is to the cell site, and adjusts its operation accordingly. As you approach the cell site, the amplifier reduces the gain, or if necessary, shuts off completely. Thus at no time is the cell site overloaded with too strong a signal. Then, as you move away from the site and signal amplification is required, the booster comes back on (if it shut down) and continually varies its gain for optimal performance. Similarly, by continuously monitoring the signal strength of nearby cell sites, the Wilson cell phone booster adjusts the transmitting signal gain (amplification) to avoid the possibility of interference with the nearby cell site, even though that site may use different frequencies or technologies.

In Canada, Wilson Electronics has worked cooperatively with the carriers TELUS and Bell Mobility. They worked closely with Wilson on the design and testing of its booster to insure its use would not cause interference with their cellular networks. In addition, TELUS developed their own standards for cellular boosters and had Wilson products tested against these standards by independent laboratories.

Wilson Electronics looks forward to working with the carriers, the CTIA, and the FCC to demonstrate that cell phone boosters are a needed product for many customers, and that they can be safely used without causing interference to the cellular networks.

Existing booster products that do not have the protections described in this white paper are known to cause interference with cellular networks. This is why Wilson believes that the FCC should amend its certification of cell phone boosters to ensure that all cellular networks are protected. All cell phone boosters should be required incorporate oscillation (feedback) detection and protection, booster shutdown or gain reduction to prevent interference with nearby cell sites, and bi-directional signal amplification of the signal from the cell site to the mobile phone, and from the mobile phone to the cell site.

The FCC certification should document tests that will ensure that any device receiving certification successfully operates as described above. Wilson also believes that the FCC should require that all

existing cell phone boosters be re-certified to the new tests within one year of the rule adoption. Wilson is prepared to work with the carriers, the CTIA, and the FCC to develop such tests. We believe that such a course of action will maximize cellular phone customer satisfaction while ensuring that all cellular networks are free from interference from poorly designed boosters.

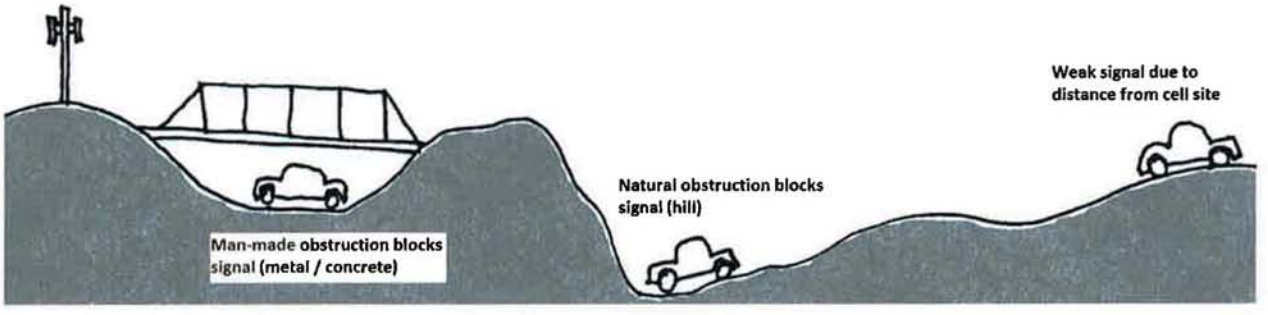
In-Car Cellular Signal Boosters

You're on your phone and you get into your car. Shortly after you close the door you begin the familiar routine, "Can you hear me?" Your call has been dropped. You are in your car on a conference call, using the Bluetooth hands-free equipment built into your car. As you travel to your destination your call is dropped several times, and you must repeatedly dial back-in. Or you may be driving from one location to another and during the drive your phone indicates that you have voice mail waiting but your phone never rang.

The problem is not just dropped calls. If you are using the Internet, you may find it takes longer than expected to access a web page or download an email. Using your phone in a car can significantly lower the speed at which data reaches your phone. And in some cases you can't even access a website or send that important email, because a data connection cannot be established.

Why does this happen?

There are two main reasons for a poor quality signal on your cellular phone. The first is simply distance from the nearest cell site. The farther you are from it, the weaker the signal. This is particularly true in rural areas, where those sites are widely spaced. The second reason is that there may be an obstacle between you and the cell site. Cellular phones communicate using radio waves, and those waves cannot travel through hills or concrete and steel buildings. And even if the signal is not blocked, it is attenuated, or reduced, by metal, glass, and even tree leaves. Thus when you are in an underground parking garage, getting a good signal can be very difficult. Likewise, if your car or office has tinted windows, you will likely have worse reception than if not, for tinted windows typically contain a metal oxide that interferes with radio waves. Further, if your phone is clipped to your belt, inside your purse, or even sitting on the seat next to you, there is even more loss of the signals to and from your phone.



Poor signal strength has another effect on your phone's performance. Wireless networks are designed to minimize the amount of power necessary for your phone to communicate with the cell site. The closer you are to a site the less power required from your phone and the longer your battery life. Conversely, the further you are from a cell site, or the more obstacles between your phone and the cell

site, the more power the phone must use to communicate, and this will shorten its battery life dramatically. This is why your car's AM/FM radio has an external antenna: it receives the signal before it is blocked by the metal in your car.

The problems described above are not uncommon. According to market research firm Harris Interactive, 67% of cell phone subscribers have at least occasional trouble with their service, such as dropped calls or no service. Allen Nogee of media research company InStat says that 35% of cell phone subscribers have switched carriers because of coverage issues. And for the 59 million Americans who live in rural areas, poor coverage can be a daily problem.

The Solution

One might think that the solution is for the wireless phone companies to build more cell sites. Unfortunately it is just not practical to guarantee coverage everywhere you might want to use a cellular phone. Wireless Network operators are constantly expanding their networks and adding more cell sites, however this is a lengthy process, taking several years for each new tower to be permitted and built.

Recently network operators and others have started selling devices which are installed in your home or office to provide you with in-building coverage but little has been done to address the issues identified above, providing better transmission and reception within your car or truck. Ten years ago most phone manufacturers offered in-car mounting kits which included an external antenna, as well as a power booster to improve the range of your phone when inside your vehicle. However, when the wireless technologies were updated to digital voice and data, the use of these types of amplifiers could actually interfere with the networks and so were discontinued.

Wilson Electronics has spent years analyzing how digital cellular networks operate. Through this work it has developed a deep understanding of the types of problems which occur when trying to amplify cell phone signals. Wilson has created a unique and smart device which permits you to take advantage of an external antenna and power booster to strengthen the signal to and from your phone. Their booster will seldom cause interference to any of the cellular networks.

Connected to a booster and the external antenna, your phone thinks there is always a cell site close by. Dropped calls are virtually eliminated and data rates are increased. Your phone's battery lasts longer as well, because the phone is no longer transmitting at full power to get its signal to the cell site. The booster's antenna, which is mounted on the outside of your car, receives the network's signal before it is attenuated by the metal and glass.

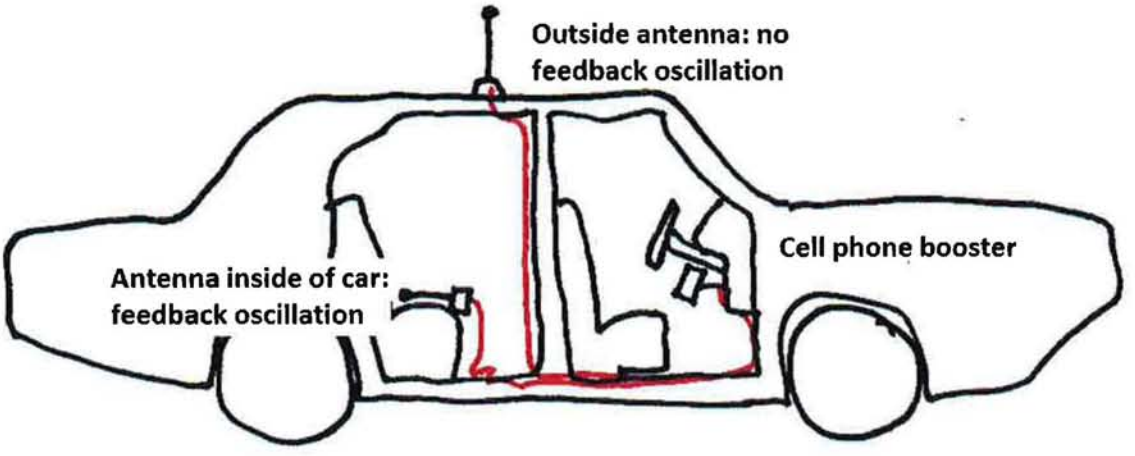
Issues

Designing a booster for a cellular phone is not a simple matter. There are a number of issues which must be overcome or else the booster will cause harm to the network and/or not provide the type of increased reception that is required. Unfortunately there are cell phone boosters currently available in

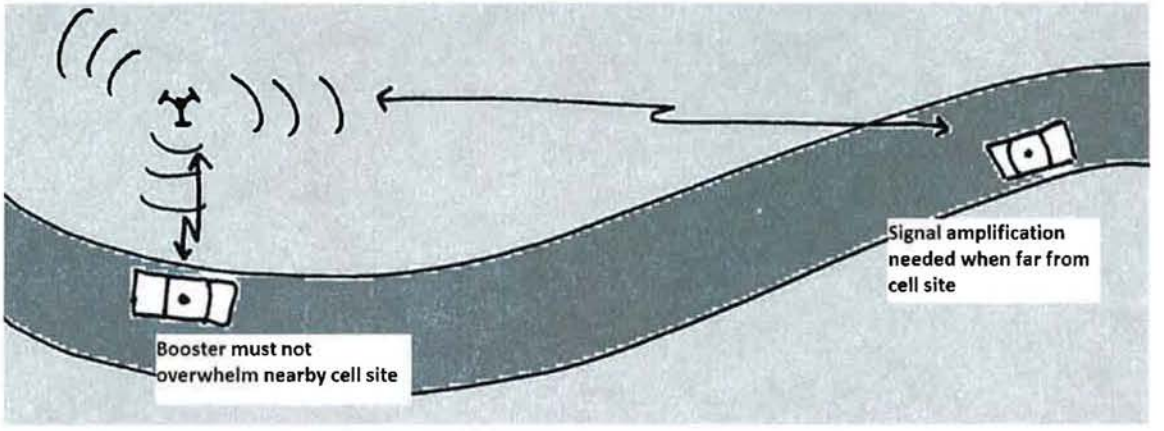
the United States that are not well designed, and which have been shown to cause problems. Currently, Wilson sets about the complex task of designing and building their boosters guided by two principles: Make sure that the booster works as advertised for the customer and do no harm to either the network to which the cell phone is communicating or to any other nearby network. It is important to note that some of the protections described in this paper and available in Wilson's current products were not built into some of its previous, "legacy," products. It is undoubtedly the case that most of the interference wireless carriers have experienced from signal boosters was caused by devices without this adequate protection built-in.

The problems which had to be solved included:

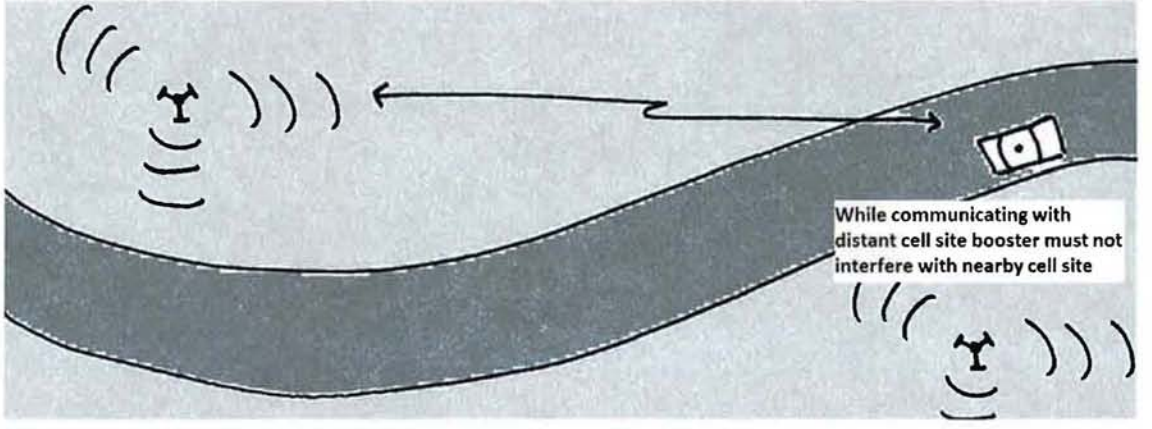
- Avoiding oscillation due to feedback. If the external antenna is placed too close to the in-car cradle (which has its own internal antenna), oscillation due to feedback could occur. You may have experienced similar feedback when a microphone is placed too close to the speaker of a public address system and a howling whine comes out of the speakers. In a cell phone booster, feedback oscillation causes the system to generate noise. This noise signal can interfere with nearby cell sites' ability to receive signals from other cell phones, causing disruption of service to other users, and could actually degrade the performance of the phone inside the vehicle. Thus it is essential to prevent feedback oscillation.



- Preventing overload of the cell site with which the phone is communicating. When you are far from the nearest cell site then the booster needs to transmit at the maximum allowable power. If you then drive close to the cell site, it must appropriately adjust itself so as not to overwhelm the cell site, disrupting service to other users (And of course if you are close to the cell site then signal amplification is not needed). This prevents any type of network overload or potential interference.



- Avoiding interference to adjacent cell sites. A more subtle variation of the above occurs when your cell phone is communicating with a distant cell site, but there is another cell site (operated by a different carrier) close by. There is a possibility that the booster could cause interference to the other carrier's cell site. If the booster transmits a strong signal in order to reach the distant site, it could potentially interfere with the nearby cell site.



Thus a booster must be designed to avoid transmitting broadband noise that would cause a problem to nearby cell sites.

These issues lead us to two overarching design principles for cellular telephone boosters:

1. Do no harm to the network. The booster must be designed so that under no circumstances will it overload or interfere with any existing wireless network. Network operators are appropriately concerned about the types of devices which can access their networks and the potential those devices to cause interference. There have been situations where devices not properly designed have caused network interference. These incidents affected not only the customers using the equipment but also those who were sharing the same cell site. Also, the booster must not interfere with other nearby networks that may operate on different frequencies or with different network technologies than that of the customer.

2. Be invisible to the network. Beyond not harming the network, a well-designed booster will essentially be invisible to the network. That is, the cellular phone communicating through the booster should always look exactly like a phone that is near the cell site. The purpose of a mobile booster is to increase the range and reliability of a customer's phone in a vehicle. At the same time the booster must be aware of the cellular network, and operate in such a way as to preclude it from overloading or interfering with the network.

To our knowledge, Wilson Electronics is the only company producing cell phone boosters that adhere to these design principles.

Wilson Electronics' Design

The cell phone boosters produced by Wilson Electronics have three key features that address the issues described above.

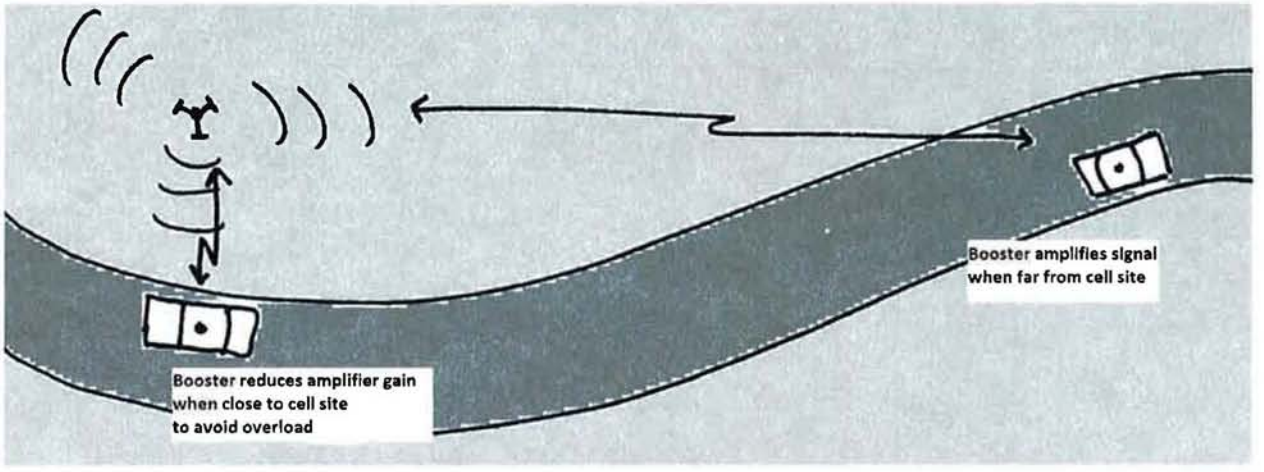
Avoiding Oscillation Due to Feedback

Oscillation protection avoids the problem of feedback. Since in-car boosters are consumer installed, it is possible that the antenna might be placed too close to the internal booster. No matter how-well written the installation instructions, some consumers may install the antenna near the booster. Or even if the initial installation is correct, the antenna might be later moved, perhaps thrown in the back seat when the vehicle is taken through a car wash.

If this happens, the next time the booster is powered on oscillation will occur, which if left unchecked causes the system to broadcast noise, interfering with the cellular network. On the Wilson booster there is an indicator light that turns red when an oscillation has occurred, informing the user that the antenna needs to be repositioned. But more importantly, the booster protects the network by detecting any oscillation. Within 10 milliseconds ($1/100^{th}$ of a second) the booster reduces gain (amplification) or shuts down if needed to prevent network interference. By designing a booster which provides both a visual indication as well as a fail-safe way of preventing oscillation from generating unwanted noise on the network, Wilson eliminates the feedback problem.

Preventing Cell Site Overload

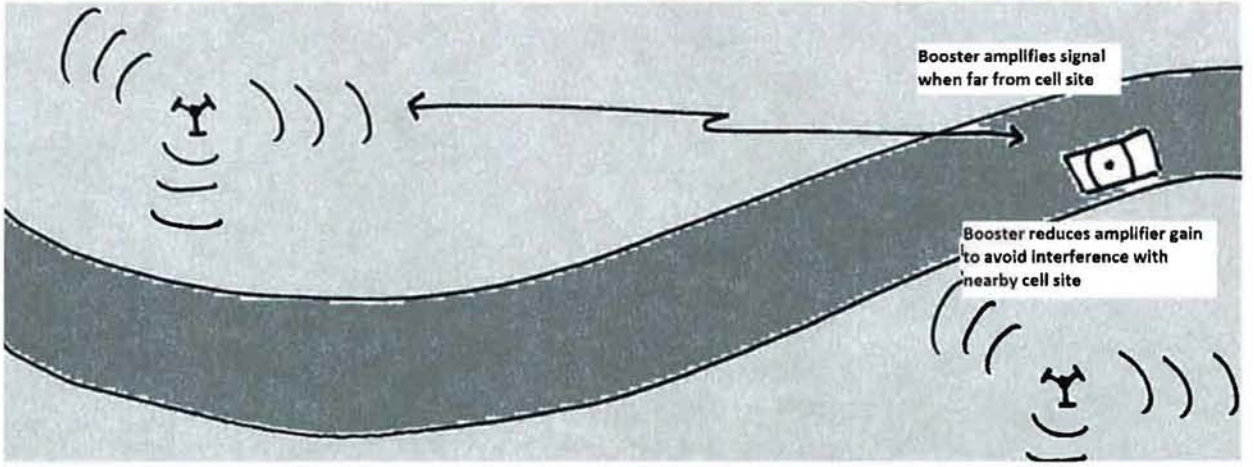
As described above, it is critical to avoid overloading a nearby cell site by broadcasting too strong a signal. When your phone is connected to the cellular network, the cell site constantly communicates with the phone, telling it to adjust the transmit power as it moves closer to or farther from the tower. This happens hundreds of times each second. The Wilson cell phone booster measures both the transmit signal strength from the phone and the incoming signal strength from the cell site. It uses these measurements to determine how close the phone is to the cell site, and adjusts its operation accordingly.



As you approach the cell site, less and less boost of your phone's signal is required. In this situation, the amplifier reduces the gain, or if necessary, shut off completely. Thus at no time is the cell site overloaded with too strong a signal. Then, as you move away from the site and signal amplification is required, the booster comes back on (if it shut down) and continually varies its gain for optimal performance.

Avoiding Interference with Nearby Cell Sites

When any broadband amplifier boosts a signal, depending on its gain, it also can generate detectable background noise. In a case where the cell site with which your phone is communicating is far away, the booster will amplify the phone's transmit signal to reach that distant site. If another carrier's site is nearby, it is essential that the booster not generate background noise that could interfere with that nearby site. By continuously monitoring the signal strength of nearby cell sites, the Wilson cell phone booster adjusts the transmitting signal gain (amplification) to avoid the possibility of interference with the nearby cell site, even though that site may use different frequencies or technologies.



As you move away from the nearby cell site, the booster can increase signal amplification to give you the best possible connection to your distant cell site without ever interfering with the nearby cell site.

Other Design Features

Beyond the three key features described above, Wilson cell phone boosters have other design features to protect the cellular networks.

It is important to ensure that the cell phone booster does not interfere with adjacent wireless channels when transmitting. Thus the Wilson transmitting amplifier is designed to have adequate dynamic range. This means that the amplifier is not straining when operating at or near full power. It ensures that the amplifier maintains a linear response to the signal from the cellular phone, and it minimizes the likelihood of the outgoing signal "bleeding" onto adjacent channels.

In addition, the booster must have amplification correctly balanced between the forward link (cell site to cell phone) and the reverse link (cell phone to cell site). Well-balanced amplification is essential to preserve the correct relative power balance in the network. If this is not done, the phone could have problems establishing a call, even though it shows "more bars" from the boosted incoming signal. Some existing products in the market in fact boost only the incoming signal to the cell phone, and do nothing to amplify the outgoing signal from the phone to the cell site. These products can actually worsen communications in areas of marginal coverage.

More than Design

All of this technology is designed to give the customer the maximum benefit of the booster while at the same time ensuring that both the customer's and other networks are fully protected and that the booster will not cause interference to any of the systems. But a great design is worthless if not well manufactured.

Wilson cell phone boosters are manufactured in the United States, in its southwestern Utah facility. Each unit is tested before being shipped. The testing is monitored in real time, and if a problem is discovered, the engineering team is immediately notified. Wilson's advantage in this area is that the engineering team is located adjacent to the manufacturing line, not 6,000 miles away, as is the case for products manufactured abroad. Thus the engineers are immediately available to troubleshoot and correct any problems before the boosters are packaged and shipped.

Experience in Canada

Wilson's experience in Canada with TELUS, one of the largest carriers in the country, is an example of the cooperation that can exist with carriers. Wilson has sold nearly 50,000 signal boosting devices in Canada, which TELUS actively markets in the best interest of the citizens of Canada. TELUS cooperated with Wilson on the design and testing of the Wilson 801209 dual-band wireless booster, to insure its use would not cause interference with the TELUS network.

In Canada most of the country is rural and cell towers are understandably sparse. Wilson's signal boosters have worked well to provide service where it was not previously possible, or reliable, without any significant system interference. In those circumstances, TELUS cooperated with Wilson in order to better serve its customers. TELUS' engineers worked closely with Wilson engineers to design and build a product that would not interfere with their CDMA system.

In addition, TELUS developed their own standards for cellular boosters and had Wilson products tested against these standards by independent laboratories. Based on Wilson's experience working with TELUS and going through all of the rigorous testing, Wilson had a similar experience with another of Canada's largest cell phone service providers, Bell Mobility. Bell understands that it is very difficult to cover every part of the country and that Wilson signal boosters can provide an effective tool to helping customers stay connected in weak signal areas. Bell Mobility has approved and marketed multiple Wilson amplifiers over the past several years.

A Call for Dialog

Wilson Electronics looks forward to working with the carriers, the CTIA, and the FCC to demonstrate that cell phone boosters are a needed product for many customers, and that they can be safely used without causing interference to the cellular networks.

Existing booster products that do not have the protections described in this white paper are known to cause interference with cellular networks. This is why Wilson believes that the FCC should amend its certification of cell phone boosters to ensure that all cellular networks are protected. All cell phone boosters should be required incorporate the following features:

1. Oscillation (feedback) must be detected and immediately responded to. The booster must either shut down or reduce amplifier gain to the point where the oscillation feedback is eliminated. This will prevent interference with nearby cell sites.

2. Nearby cell sites must be detected and immediately responded to. The booster must either shut down or reduce amplifier gain to the point where the output does not exceed established standards. This will prevent the booster's transmissions from overloading the nearby cell site.

3. The booster must support bi-directional signal amplification of the signal from the cell site to the mobile phone, and from the mobile phone to the cell site. Lack of bi-directional amplification can affect the balance of the cellular network.

The FCC certification should document tests that will ensure that any device receiving certification successfully operates as described above. Wilson also believes that the FCC should require that all existing cell phone boosters be re-certified to the new tests within one year of the rule adoption. Wilson is prepared to work with the carriers, the CTIA, and the FCC to develop such tests.

We believe that such a course of action will maximize cellular phone customer satisfaction while ensuring that all cellular networks are free from interference from poorly designed boosters.

Conclusion

Many cell phone users experience dropped calls and slow data rates when using their phones in their cars. While there are a number of booster products in the market today, the Wilson booster is the only one which provides feed-back to the customer that it is installed correctly as well as protection against interfering with cell sites, even cell sites from other networks.

In-car or mobile cellular phone signal boosters:

- Are important products that can improve the satisfaction of cellular phone customers when they are using their phones while in their cars by virtually eliminating dropped calls and boosting data download rates.
- Can be designed and built such that they do not interfere with the operation of cellular networks.
- Should be certified by the FCC, using amended rules to ensure only well-designed boosters achieve that certification.
- Wilson Electronics wants to work with the FCC, CTIA, and carriers to make this happen

Inferior in-car or mobile cellular signal boosters that do not meet the features described on the market are already available today, and people are buying them. We believe that as consumers become more aware of them, network interference problems will only increase. The best solution, therefore, is to ensure that only products demonstrated as non-interfering should be certified for use.

Working together, the FCC, CTIA, cellular carriers and Wilson Electronics can deliver in-car cellular signal boosters that will improve customer satisfaction while protecting the cellular networks.

Andrew M. Seybold

Robert O'Hara